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FOR KARNATAKA CLASS 12 PREPARATION

Karnataka 2nd PUC Model Question Paper 2027 for Statistics (Paper 4)

EXAM	YEAR	TYPE	SUBJECT
Karnataka Class 12	2027	Sample Paper	Statistics

GOVERNEMENT OF KARNATAKA

KARNATAKA SCHOOL EXAMINATION AND ASSEMENT BOARD

6th CROSS, MALLESHWARAM, BENGALURU-560 003

2026-27 II PUC MODEL QUESTION PAPER- 4

Subject: 31 - Statistics **Maximum Marks:** 80

Time: 3.00 Hours **No. of Questions:** 38

Instructions:

1. Statistical tables and graph sheets will be supplied on request.
2. Scientific calculators are allowed.
3. All working steps should be clearly shown.
4. For 'Section – A' questions, only the first written answers will be considered for evaluation.
5. For the question having graph, alternative question is given at the end of the question paper in a separate section for visually challenged students.

SECTION – A

I. Choose the most appropriate answer from the choices given: (5 X 1 = 5)

1) Which of the following birth rates indicates the growth rate of a population due to live births?
a) Crude birth rate b) General fertility rate c) Age specific fertility rate d) Total fertility rate

2) The condition for the circular test with usual notation is
a) $P_{01} \times P_{12} \times P_{02} = 1$ b) $P_{01} \times P_{12} \times P_{20} = 1$ c) $P_{10} \times P_{12} \times P_{20} = 1$ d) $P_{01} \times P_{10} = 1$

3) The mode of a chi-square distribution with 10 degrees of freedom is
a) 20 b) 10 c) 8 d) 0

4) The probability of rejecting H_0, when it is not true is called
a) Type – I error b) Type – II error c) Size of the test d) Power of a test

5) In a transportation problem, any basic feasible is said to be non-degenerate when number of positive allocation is equal to
a) m – n + 1 b) m + n – 1 c) n – m +1 d) m + n + 1

II. Fill in the blanks by choosing the appropriate answers given in the brackets: (5 X 1 = 5)

(Estimate, Estimator, Strategy, Defect, Cohort, Positively)

6) The size of the _____ is Radix in a life table.

7) The chi-square distribution curve is _____ skewed.

8) An _____ is the likely value of the unknown parameter.

9) A _____ is a quality characteristic which does not conform to specifications.

10) The _____ of a player is the pre-determined rule by which a player determines his course of action.

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III. Match the following: **(5 X 1 = 5)**

11)

A	B
a. Infant	i. Range: 0,1
b. Cost of living index number	ii. Producer's risk
c. Bernoulli distribution	iii. Child aged less than one year
d. Level of significance	iv. Minimax
e. Maximum of row minimums	v. Retail price of commodities
	vi. Maximin

IV. Answer the following questions: **(5 X 1 = 5)**

12) What is the value of the index number of the base year?

13) Which component of the time series is associated with "the increase in online payment for a long period of time"?

14) Write the relationship between mean and variance of a Bernoulli distribution.

15) Define 'type – I error' in testing of hypothesis.

16) When is the transportation problem said to be unbalanced?

SECTION – B

V. Answer any FIVE of the following questions: **(5 X 2 = 10)**

17) State the different phases of a business cycle.

18) Write two conditions for applying Newton's advancing difference method of interpolation.

19) If a binomial distribution has mean 3 and variance 2, then find the value of 'p'.

20) Calculate the variance of a student's t-distribution with 4 degrees of freedom.

21) Given: P = 0.3 and n = 200, find S.E.(p).

22) Mention two types of estimation in statistical inference.

23) Name the control charts for attributes.

24) Pay-off matrix of player – A is given below. Write the pay-off matrix of player – B.

Player – A	Player – B: B_1	B_2
A_1	3	-2
A_2	1	3
A_3	-5	4

SECTION – C

VI. Answer any FOUR of the following questions: **(4 X 5 = 20)**

25) Calculate suitable price index number from the following data.

Item	Base year price (in Rs)	Current year	
		Price (in Rs)	Quantity
A	13	16	20
B	15	21	30
C	21	25	40
D	25	31	50

26) Interpolate and extrapolate the production for the years 2025 and 2027 by using binomial expansion method.

Year	2022	2023	2024	2025	2026	2027
Production ('000 tons)	32	50	80	-	140	-

27) It is known that 2% of the items manufactured by a firm are defective. Items are supplied in packets of 50 each. What is the probability that a randomly selected packet contains at least one defective item?

28) In a hyper-geometric distribution, if the parameters are a =4, b = 8, and n = 6, then find:
a) P (X = 2), b) standard deviation.

29) Test whether mean daily wages of workers of factory – A and factory – B are equal from the following data. (Use 1% level of significance).

Factory	No. of workers	Mean daily wage (in Rs)	Standard deviation (in Rs)
A	50	405	10
B	200	410	20

30) The cost of an equipment is Rs 52,000 and its scrap value is Rs 2,000. The maintenance costs found from the past experience are as follows:

Year	1	2	3	4	5	6
Maintenance cost (in Rs)	1000	2000	4000	7000	12000	20000

Find the optimum replacement period.

31) The demand for an item is 8000 units/year. The cost of placing an order is Rs 360. The holding cost is Rs 16/unit/year. The shortage cost is Rs 3/unit/year. Find:
(i) Economic order quantity
(ii) Re-order time.

VII. Answer any TWO of the following questions: (2 X 5 = 10)

32) If X is a normal variate with mean μ and standard deviation σ, find the probability that X takes a value in the 1σ neighbourhood of μ.

33) Test whether the attributes of 'education' and 'employment' are independent at 1% level of significance for the following data.

	Employed	Unemployed
Educated	20	30
Uneducated	30	20

34) Find the control limits for R-chart from the following data, given n = 5.

Sample number	1	2	3	4	5	6
Range	14	8	11	9	6	12

35) Solve the following linear programming problem graphically:
Minimize $Z = 50x + 60y$
Subject to constraints: $5x + 4y \leq 40$
$3x + 4y \geq 24$
and $x, y \geq 0$

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SECTION – D

VIII. Answer any TWO of the following questions: **(2 X 10 = 20)**

36) a) Calculate gross reproduction rate from the following data. **(05)**

Age group (in years)	Female population	Female births
15 – 19	15000	450
20 – 24	13000	780
25 – 29	12500	625
30 – 34	11000	440
35 – 39	10000	300
40 – 44	8500	85
45 – 49	7000	42

b) Calculate standardized death rates of the two towns from the following table.

Age group (in years)	Deaths per thousand		Standard population
	Town – A	Town – B	
Below 21	20	25	10000
21 – 40	5	7	20000
40 – 60	10	11	15000
60 and above	40	45	5000

37) Calculate Dorbish – Bowley's and Fisher's price index numbers for the following data.

Item	2021		2025	
	Price (in Rs)	Quantity	Price (in Rs)	Quantity
A	14	12	20	15
B	20	14	27	20
C	25	16	22	30
D	27	21	38	28

38) Fit a straight line trend equation of the form $y = a + bx$ by using the method of least squares for the following time series data. Obtain the trend values and estimate the value for the year 2026.

Year	2021	2022	2023	2024	2025
Value	20	32	24	36	28

SECTION - E
(For Visually challenged students only)

35) Write the procedure of solving linear programming problem graphically.

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